b) obtaining a measurement of said channel at said receiver;

c) using said measurement to compute for each of said proposed mapping schemes a minimum Euclidean distance $d_{min,rx}$ of said symbols when received; and

d) selecting an applied mapping scheme from said proposed mapping schemes based on said minimum Euclidean distance $d_{min,rx}$, thereby controlling said communication parameter.

2. The method of claim 1, wherein said proposed mapping schemes comprise modulating said data in a constellation selected from the group consisting of PSK, QAM, GMSK, FSK, PAM, PPM, CAP, CPM.

3. The method of claim 1, wherein said proposed mapping schemes comprise coding said data at predetermined coding rates.

4. The method of claim 1, wherein said proposed mapping schemes comprise at least one method selected from the group consisting of diversity coding and spatial multiplexing.

5. The method of claim 4, wherein said at least one method comprises diversity coding of order k ranging from 1 to M.

6. The method of claim 5, wherein said diversity coding is selected from the techniques consisting of space-time block coding, transmit antenna selection, Equal Gain Combining, Maximum Ratio Combining and delay diversity coding.

7. The method of claim 5, wherein said proposed mapping scheme comprises a random assignment of said transmit signals TS_p to a number k of said M antennas.

8. The method of claim 5, wherein said proposed mapping scheme comprises an assignment of said transmit signals TS_p to a number k of said M antennas based on a required minimum Euclidean distance $d_{min,required}$.

9. The method of claim 8, wherein said required minimum Euclidean distance $d_{min,required}$ is related to a quality parameter of said data.

10. The method of claim 4, wherein said at least one method comprises spatial multiplexing of order k ranging from 1 to M.

11. The method of claim 10, wherein said spatial multiplexing comprises a random assignment of said transmit signals TS_p to a number k of said M antennas.

12. The method of claim 10, wherein said spatial multiplexing comprises an assignment of said transmit signals TS_p to a number k of said M antennas based on a required minimum Euclidean distance $d_{min,required}$.

13. The method of claim 12, wherein said required minimum Euclidean distance $d_{min,required}$ is related to a quality parameter of said data.

14. The method of claim 10, wherein said receive unit is selected from the group consisting of maximum likelihood receivers, zero forcing equalizer receivers, successive cancellation receivers and minimum mean square error receivers.

15. The method of claim 1, wherein a minimum Euclidean distance $d_{min,tx}$ of said symbols when transmitted is stored in a database.

16. The method of claim 15, wherein said database is located in a unit selected from the group consisting of said transmit unit and said receive unit.

17. The method of claim 1, wherein said communication parameter is selected from the group consisting of data capacity, signal quality, spectral efficiency and throughput.

18. The method of claim 1, further comprising:

a) determining a quality parameter of said data;

b) establishing a relation between said quality parameter and a required minimum Euclidean distance $d_{min,required}$ necessary to satisfy said quality parameter.

19. The method of claim 18, wherein said quality parameter is selected from the group consisting of signal-to-interference noise ratio, signal-to-noise ratio, power level, level crossing rate, level crossing duration, bit error rate, symbol error rate, packet error rate, and error probability.

20. The method of claim 1, wherein said transmit unit and said receive unit operate in accordance with at least one multiple access technique selected from the group consisting of TDMA, FDMA, CDMA, OFDMA.

21. The method of claim 20, wherein said proposed mapping schemes comprise diversity coding selected from the group consisting of space-time block coding, transmit antenna selection, Equal Gain Combining, Maximum Ratio Combining and delay diversity coding.

22. A method of controlling a communication parameter of a channel for transmitting data between a transmit unit having a number M of transmit antennas and a receive unit having a number N of receive antennas, said method comprising:

a) providing proposed mapping schemes for converting said data into symbols and assigning said data to transmit signals TS_p, where $p=1 \ldots M$, for transmission from said M transmit antennas;

b) obtaining a measurement of said channel at said receiver;

c) using said measurement to compute for each of said proposed mapping schemes a probability of error P(e) in said symbols when received; and

d) selecting an applied mapping scheme from said proposed mapping schemes based on said probability of error P(e), thereby controlling said communication parameter.

23. The method of claim 22, wherein said proposed mapping schemes comprise modulating said data in a constellation selected from the group consisting of PSK, QAM, GMSK, FSK, PAM, PPM, CAP, CPM.

24. The method of claim 22, wherein said proposed mapping schemes comprise coding said data at predetermined coding rates.

25. The method of claim 22, wherein said proposed mapping schemes comprise at least one method selected from the group consisting of diversity coding and spatial multiplexing.

26. The method of claim 25, wherein said at least one method comprises diversity coding of order k ranging from 1 to M.

27. The method of claim 26, wherein said diversity coding is selected from the techniques consisting of space-time block coding, transmit antenna selection, Equal Gain Combining, Maximum Ratio Combining and delay diversity coding.

28. The method of claim 26, wherein said proposed mapping scheme comprises a random assignment of said transmit signals TS_p to a number k of said M antennas.

29. The method of claim 26, wherein said proposed mapping scheme comprises an assignment of said transmit signals TS_p to a number k of said M antennas based on a required probability of error $P(e)_{req}$.

30. The method of claim 25, wherein said at least one method comprises spatial multiplexing of order k ranging from 1 to M.

31. The method of claim 30, wherein said spatial multiplexing comprises a random assignment of said transmit signals TS_p to a number k of said M antennas.

32. The method of claim 30, wherein said spatial multiplexing comprises an assignment of said transmit signals TS_p to a number k of said M antennas based on a required probability of error $P(e)_{req}$.

33. The method of claim 30, wherein said receive unit is selected from the group consisting of maximum likelihood receivers, zero forcing equalizer receivers, successive cancellation receivers and minimum mean square error receivers.

34. The method of claim 22, wherein a minimum Euclidean distance $d_{min,tx}$ of said symbols when transmitted is stored in a database.

35. The method of claim 34, wherein said database is located in a unit selected from the group consisting of said transmit unit and said receive unit.

36. The method of claim 22, wherein said communication parameter is selected from the group consisting of data capacity, signal quality, spectral efficiency and throughput.

37. The method of claim 22, wherein said transmit unit and said receive unit operate in accordance with at least one multiple access technique selected from the group consisting of TDMA, FDMA, CDMA, OFDMA.

38. The method of claim 37, wherein said proposed mapping schemes comprise diversity coding selected from the group consisting of space-time block coding, transmit antenna selection, Equal Gain Combining, Maximum Ratio Combining and delay diversity coding.

39. A communication system with a controlled communication parameter of a channel for transmitting data between a transmit unit having a number M of transmit antennas and a receive unit having a number N of receive antennas, said transmit unit having a mapping circuit comprising:

a) a conversion unit for converting said data into symbols;
b) an assigning unit for assigning said data to transmit signals TS_p, where p=1 . . . M, for transmission from said M transmit antennas, said converting and said assigning being in accordance with proposed mapping schemes;

said receive unit comprising:

a) a channel estimator for obtaining a measurement of said channel;
b) a computing block for computing for each of said proposed mapping schemes a minimum Euclidean distance $d_{min,rx}$ of said symbols when received; and
c) a selection block for selecting an applied mapping scheme from said proposed mapping schemes based on said minimum Euclidean distance $d_{min,rx}$, thereby controlling said communication parameter.

40. The communication system of claim 39, wherein said assigning unit comprises a diversity coding block and a spatial multiplexing block.

41. The communication system of claim 40, wherein said diversity coding block comprises at least one block selected from the group consisting of a space-time coding block, a transmit antenna selection block, Equal Gain Channel coding block, Maximum Ratio Channel coding block and delay diversity coding block.

42. The communication system of claim 40, wherein said receive unit is selected from the group consisting of maximum likelihood receivers, zero forcing equalizer receivers, successive cancellation receivers and minimum mean square error receivers.

43. The communication system of claim 39, further comprising a database for storing a minimum Euclidean distance $d_{min,tx}$ for said symbols when transmitted.

44. The communication system of claim 39, wherein said computing block is selected from the group consisting of blocks for computing data capacity, signal quality, spectral efficiency and throughput.

45. The communication system of claim 44, further comprising a quality parameter computation block for determining a quality parameter of said data, said quality parameter being selected from the group consisting of signal-to-interference noise ratio, signal-to-noise ratio, power level, level crossing rate, level crossing duration, bit error rate, symbol error rate, packet error rate, and error probability.

46. The communication system of claim 45, further comprising an assessment block for establishing a correlation between said quality parameter and a required minimum Euclidean distance $d_{min,required}$.

47. The communication system of claim 39, said communication system operating in accordance with at least one multiple access technique selected from the group consisting of TDMA, FDMA, CDMA, OFDMA.

48. A communication system with a controlled communication parameter of a channel for transmitting data between a transmit unit having a number M of transmit antennas and a receive unit having a number N of receive antennas, said transmit unit having a mapping circuit comprising:

a) a conversion unit for converting said data into symbols;
b) an assigning unit for assigning said data to transmit signals TS_p, where p=1 . . . M, for transmission from said M transmit antennas, said converting and said assigning being in accordance with proposed mapping schemes;

said receive unit comprising:

a) a channel estimator for obtaining a measurement of said channel;
b) a computing block for computing for each of said proposed mapping schemes a probability of error P(e) of said symbols when received; and
c) a selection block for selecting an applied mapping scheme from said proposed mapping schemes based on said probability of error P(e), thereby controlling said communication parameter.

49. The communication system of claim 48, wherein said assigning unit comprises a diversity coding block and a spatial multiplexing block.

50. The communication system of claim 49, wherein said receive unit is selected from the group consisting of maximum likelihood receivers, zero forcing equalizer receivers, successive cancellation receivers and minimum mean square error receivers.

51. The communication system of claim 48, wherein said diversity coding block comprises at least one block selected from the group consisting of a space-time coding block, a transmit antenna selection block, Equal Gain Channel coding block, Maximum Ratio Channel coding block and delay diversity coding block.

52. The communication system of claim 48, further comprising a database for storing a required probability of error $P(e)_{req}$.

53. The communication system of claim 48, wherein said computing block is selected from the group consisting of blocks for computing data capacity, signal quality, spectral efficiency and throughput.

54. The communication system of claim 53, further comprising a quality parameter computation block for determining a quality parameter of said data, said quality parameter being selected from the group consisting of signal-to-interference noise ratio, signal-to-noise ratio, power level, level crossing rate, level crossing duration, bit error rate, symbol error rate, packet error rate, and error probability.

55. The communication system of claim 48, said communication system operating in accordance with at least one multiple access technique selected from the group consisting of TDMA, FDMA, CDMA, OFDMA.

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